

DATA SHEET

# Pitney Bowes Spectrum™

## Location Intelligence Solution

GEOCONFIDENCE MODULE

ELIMINATE UNCERTAINTY WITH GEOGRAPHIC DETERMINATION AND GAIN CONFIDENCE IN YOUR GEOGRAPHICALLY SENSITIVE BUSINESS DECISIONS



### Summary

The value of a geocoded address does not come from the latitude and longitude data itself, but from the resulting business information. The Spectrum GeoConfidence Module incorporates qualitative error tolerance reporting to derive a “location quality code,” and assigns a confidence level to the accuracy of the geocode.

### Benefits

- Provides highly accurate and targeted solutions
- Enables faster, more informed business decisions
- Allows analysts and staff to focus on implementation rather than building and maintaining
- No programming code required to add additional data or use with existing functionality
- Takes geocoding applications to the next level

### OVERVIEW

Many organizations rely on precision geocoding to automate business decisions with a high degree of confidence. However, a fair percentage of locations do not get precision geocode assignments either because the reference data does not exist or because the quality of the data is poor. These exceptions require time consuming and often costly intervention. Spectrum GeoConfidence Module, part of the Pitney Bowes Spectrum Enterprise Location Intelligence Solution, offers a new way of working with geocoded addresses, allowing organizations to turn those exceptions into automated and confident decisions without the need for precision geocoding or manual interventions. Instead of taking the returned point “as is,” a confidence level can now be associated with the geocode and used for making high quality geographic determinations.

### Using Geographic Determination

The spatial question, “Does this point fall in this polygon?” may be addressing a multitude of business questions, such as:

- “Does this customer live in the area we service?”
- “Does this property fall into a flood zone, or if not, how close is the nearest flood zone?”
- “Is this policy holder still in my territory?”
- “How far from the central office is this new subscriber?”
- “Do our service areas overlap?”

This is only a representative list of possible applications. The resulting answer allows for informed decision making.

But how confident are we that the answer provided is correct?

The calculations made in the initial geocoding process may have produced an answer, which contains some degree of uncertainty. To help eliminate this uncertainty, a confidence factor needs to be determined and associated with the geocode so that additional business rules may be applied. This confidence factor can be described as either a distance value (between points and/or lines) or as a percentage (the amount of overlap between two polygons).

Geographic determination describes not only the spatial relationship between two entities, but also the degree of confidence in that description. High confidence determinations, based on any level of geocode (address, ZIP+4, ZIP+2, and ZIP Code), are critical for many geographically sensitive business decisions.

The Spectrum GeoConfidence Module is robust and flexible enough to be utilized in a broad range of situations and it provides improvement over previous approaches to increase the level of confidence.

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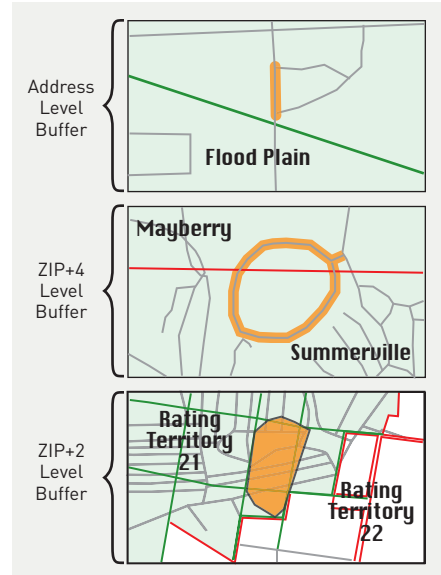
### GEOCONFIDENCE MODULE

HIGH CONFIDENCE DETERMINATIONS, BASED ON ANY LEVEL OF GEOCODE, ARE CRITICAL FOR MANY GEOGRAPHICALLY SENSITIVE BUSINESS DECISIONS.

### How GeoConfidence Works

Geographic determinations are made by creating a region that describes where the geocode might reside. For an address-level geocode, this region is normally a buffer around the street segment on which the geocode is assigned. For ZIP+2 Codes, the buffer may be the neighborhood in which that ZIP+2 is used. This buffer can be thought of as a “confidence surface” – a region that describes with high confidence where the address may be. Spectrum GeoConfidence Module provides a number of routines, which takes the confidence surface and compares it against other spatial features. This allows for precision analysis by automated business applications, which in turn reduces potential erroneous determinations.

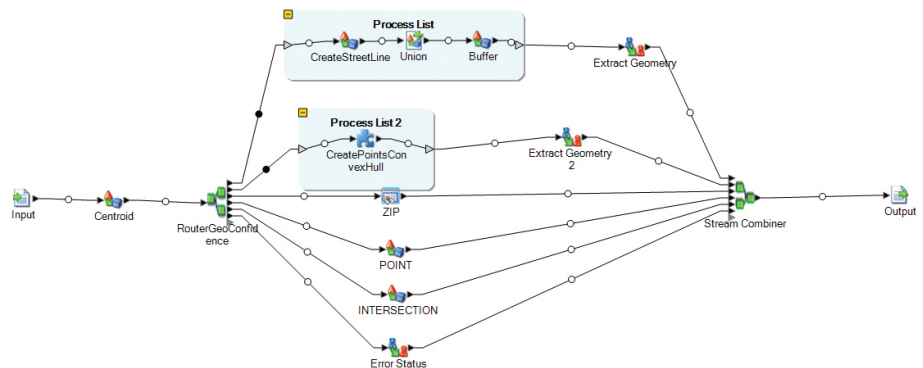
Regardless of the quality of the address match, certain degrees of variance are incorporated into estimating the longitude and latitude of the address location. Spectrum GeoConfidence Module has incorporated qualitative error tolerance reporting into its geocoding technology, and returns the error tolerance value as a “location quality code.” The dynamic area, or buffer, around the geocode, becomes a



Confidence Surface

“confidence surface.” The confidence surface performs real-time spatial comparisons and confidence level assignments. The information is then leveraged to perform geographic determination and quantitative confidence level assignments of each address processed.

No other geocoding system offers you this type of information on a match-by-match basis.



Spectrum GeoConfidence Routine

### Functionality Summary

The generic functions described below can be coupled with spatial data files to provide targeted, industry specific solutions, and can also be used with other data sources to allow Spectrum GeoConfidence Module integration with either pre-existing or anticipated data sets. Users are able to add additional data and use it with existing functionality without writing program code.

### Confidence Surface Generation

The confidence surface provides the smallest possible area wherein an address is likely to be located. Spectrum GeoConfidence Module has developed an advanced methodology for generating the confidence surfaces. Using the percent overlap of the confidence surface compared with target geographic entities, a confidence level for each intersecting area can be determined.

### Confidence Surface-to-Polygon Percentage

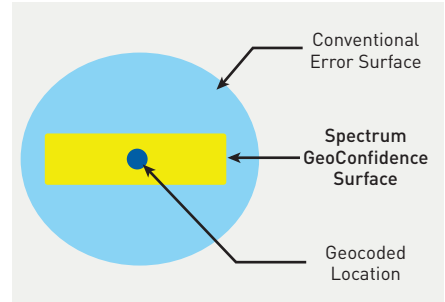
The overlap can be used to determine what percentage of a confidence surface overlaps a given polygon. The percentage overlap determines the confidence rating. These confidence ratings can be incorporated into business rules to improve decision making.

### Find Farthest Distance from a Confidence Surface to Nearest Point of Nearest Line

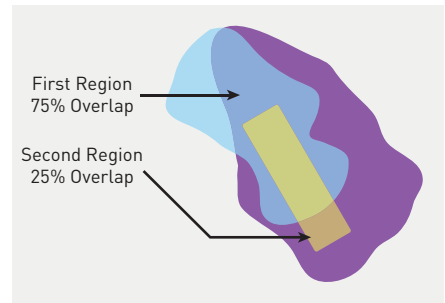
The distance between the farthest point of the confidence surface boundary to the nearest point of the line is defined as the farthest distance. When used with the Find Nearest Distance from a Confidence Surface to Nearest Point of Nearest Line function, a margin of error can be calculated.

### Find Nearest Distance from a Confidence Surface to Nearest Point of Nearest Line

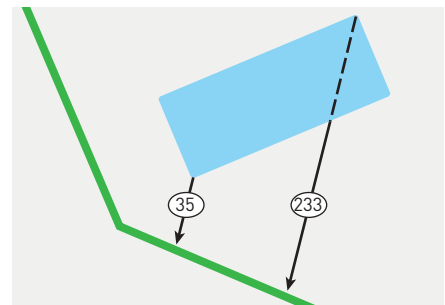
The nearest distance from a polygon to the nearest point of the nearest line can be used to determine the minimum distance between a polygon boundary and the nearest line. The distance between the closest point of



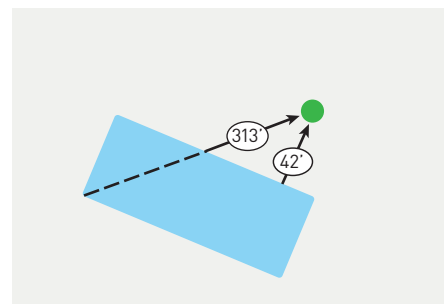
Confidence and Error Surface Comparison



Confidence Surface-to-Polygon Percentage



Find Farthest Distance from a Confidence Surface to Nearest Point of Nearest Line



Find Nearest Distance from a Confidence Surface to Nearest Point of Nearest Line

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the confidence surface boundary to the closest point of the line is defined as the nearest distance. When used with the Find Farthest Distance from a Confidence Surface to Farthest Point of Nearest Line function a range of error can be calculated.

#### **Find Farthest Distance from a Confidence Surface to Nearest Point**

The distance between a point and the most distant point of the confidence surface is defined as the farthest distance. When used with the Find Farthest Distance from a Confidence Surface to Nearest Point function this provides a margin for error. This function returns the maximum possible distance between points.

#### **Find Nearest Distance from a Confidence Surface to Nearest Point**

The distance between closest point of the confidence surface and a point is defined as the nearest distance. When used with the Find Farthest Distance from a Confidence Surface to Nearest Point function this provides a margin for error. This function returns the minimum possible distance between points.

### Many Uses for GeoConfidence

Working with both Spectrum Enterprise Geocoding and Spectrum Enterprise Location Intelligence Modules, Spectrum GeoConfidence Module users get results and benefit in many business situations such as:

- Flood-Zone determination
- Rating Territory Assignment
- Tax Jurisdiction assignment

For example, the Spectrum GeoConfidence Module can be used to help make decisions on a flood zone rating based on how much overlap there is between the geoconfidence surface and the flood zone data. Anything greater than a 95% overlap of the geoconfidence surface with a 100-year flood zone may indicate that the address is in the flood zone. Conversely, anything less than 95% could trigger a manual review.

With Spectrum Enterprise Location Solution GeoConfidence Module you have the means to tightly integrate not only a geocoding solution, but to associate a confidence level with the resulting geocode. You gain efficiencies from having processes automated and from not having to build and maintain highly complex sets of processing logic.

**GET TO KNOW YOUR CUSTOMERS BETTER AND GAIN THE INSIGHT YOU NEED TO MAKE BETTER DECISIONS – ENTERPRISE-WIDE. FOR MORE INFORMATION ON SPECTRUM ENTERPRISE LOCATION INTELLIGENCE SOLUTIONS, CALL US TODAY OR VISIT OUR WEBSITES.**

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